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Attorney for Applicant

PATENT
Docket No. CER-991476

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Ceramatec, Inc.	)
Serial No.:	09/603,179	) Art Unit: 1744
Filed:	June 26, 2000	)
For:	Sanitizing Device and Associated Method	)
Examiner:	Krisanne Jastrzab	)

Proposed Interview Agenda
(For discussion purposes only, not for entry)

Dear Examiner Jastrzab:

Thank you for agreeing to an interview to discuss the above-captioned case in view of the Advisory Action mailed April 14, 2006. Applicant believes that there is room to amend the application to overcome the rejections cited in the Office Action dated February 7, 2006 without introducing new matter.

To facilitate discussion and to provide some background, Applicant sets forth the following summaries of the Section 102 references cited in Examiner's final office action.

Pat. No. 4,583,548 to Schmid

The objective of Schmid's invention is to overcome the problem of interference voltage that interferes with a bioelectric signal and to do it in a way that does not cause skin irritation. See Schmid Col. 1 lines 47-51. Schmid teaches a particular arrangement of electrodes and electrolytes to accomplish his objectives. It is the "particular formation of the interfacial regions [that] assure low offset DC voltages." See Schmid Col. 1, lines 63-65. The title of Schmid's patent, "Bioelectric Electrode-Arrangement" clearly identifies the focus of the invention.

The arrangement taught by Schmid, the arrangement that is the subject of his invention, requires *two* electrolyte layers combined in a spaced relationship. Schmid specifically calls out

that "the electrolyte intermediate layer preferably containing also an iodine ion-forming substance and suitably having the same quantitative or at least the same qualitative composition as the contact-electrolyte layer, will assure a considerable reduction of the interference voltages of the electrode assembly." Col. 2 lines 9-14. Schmid requires the combination of *two* electrolyte layers to accomplish his objectives. Schmid utilizes six examples to describe his invention and in all six instances, Schmid references the use of *two* electrolyte layers. Col. 4, lines 21, 33, 44, 52, 63, and Col. 5 line 7. Schmid does not teach the use of a single electrolyte layer by itself.

Schmid also requires the use of an electrode that contains an iodine ion forming substances and/or an electrolyte layer that contains an iodine ion-forming salt. In fact, Schmid notes that "the major component by weight in the electrolyte layers is the iodine ion-forming substance." Col. 2, lines 59-60. Schmid further states that "the offset DC-voltage can also be substantially lowered if an iodine ion producing substance, in particular triiodomethane (CHI_3), is admixed to the carbon." Col. 3, lines 6-9.

Functionally, Schmid teaches that the sources of iodine, namely iodine salts and/or triiodomethane in the electrodes, direct iodine ions towards the skin. This configuration not only helps reduce interference voltage, but has a disinfecting effect on the skin. Col. 1, lines 55-63.

Pat. No. 5,972,196 to Murphy et al.

Murphy's invention "relates generally to improvements in the production of ozone (O_3)." Col. 1 lines 16-17. Murphy teaches the production of ozone by "the electrolytic process, wherein an electric current (normally D.C.) is impressed across electrodes immersed in an electrolyte, i.e., electrically conducting, *fluid*. The electrolyte includes water, which, in the process, dissociates into its respective elemental species, O_2 and H_2. Under the proper conditions, the oxygen is also evolved as the O_3 species." Col. 1, line 66 – Col. 2, line 5. Murphy is clear that his invention requires water. Murphy teaches the making of ozone from water.

Murphy describes his invention as the "[t]he electrochemical reactions of the present invention occur[ing] by applying DC electricity between the anode and cathode. Water is fed to the anode side where two competing water oxidation reactions take place; the thermodynamically favored oxygen (O_2) evolution reaction . . . and the ozone (O_3) formation reaction . . . ." Col. 8, lines 61-66. Murphy utilizes water to create ozone as a disinfecting agent.

App. No. 09/603,179 to Applicant

In contrast to Schmid and Murphy, Applicant only claims a single electrolyte and does not utilize water. Furthermore, Applicant claims a structure for generating 7 different disinfecting ions as well as corona. In addition to iodine, Applicant claims and discloses the generation of silver ions, copper ions, oxygen ions, bromine ions, chlorine ions, and fluorine ions as sanitizing agents. Schmid does not teach sanitizing ion generation. Schmid teaches the combination of two electrolyte layers for reducing interference when measuring biological potentials. Thus, Applicant's device is both structurally and functionally different from Schmid's invention.

Schmid's invention is complex. Schmid's device is for taking a bio-electric measurement

of a skin surface. In every embodiment, the electrode component of Schmid includes at least 4 components. Schmid does not produce a sanitizing agent. Schmid starts out with a free source of iodine in the form of a triiodomethane. This requires a second electrolyte layer that contacts the skin. In stark contrast, Applicant requires one less electrolyte layer because it creates its sanitizing agent and does not use a free source for its sanitizing agent. This is part of the novelty of Applicant's device. It can accomplish its objectives with fewer parts.

Schmid requires large sources of iodine. This is a specific objective of the Schmid invention. Schmid uses electrodes having an iodine source. Applicant's device does not. Instead, Applicant passes a sanitizing ion or corona to the area to be sanitized by using a voltage. Applicant does not sanitize with iodine. Applicant teaches using sanitizing ions that have good conductivity. In fact, Applicant teaches using electrolytes made of material having ionic conductivity greater than approximately 10 to the power -10 (ohm cm)$^{-}$1. The conductivity of iodine ions is well below this threshold. In fact, Applicant teaches using sanitizing ions which are approximately 10,000 times more conductive than iodine.

Every embodiment of Schmid teaches two electrolytes and iodine. The only direct reference to iodine in Applicant's application is to AgI, PbI_2, and CuI. Other than PbI_2, these compounds release silver and copper ions to the surface to be sanitized. Applicant utilizes the metal ions uses these compounds as a source of silver (Ag) ions and copper (Cu) ions. Silver and Copper ions are between 10 to 100 trillion times more conductive than iodine. The conductivity of silver and copper ions are in the range of 10 to the power -4 to -5 (ohm cm)$^{-1}$. Schmid requires the use of triiodomethane as an organic iodine source because he cannot produce the iodine he needs through iodine ion conductivity.

It is important to note that using applicant's device to provide the iodine required by Schmid would require such a high voltage to move the iodine ions through the electrolyte layers that the electrolyte layer would be in danger of decomposing. Schmid avoids this by using a separate free iodine source and/or an iodine laced cathode. Applicant improves upon Schmid by reducing the number of parts and the overall complexity of the system. It can do this because Applicant's objectives are different from Schmid's objectives. It is simply impossible to practice Schmid using Applicant's structure. Thus Applicant's claimed invention is an improvement on the prior art.

Applicant's device, as claimed and as used, is also structurally and functionally different from Murphy' invention. Murphy teaches an electrolytic process Applicant teaches the generation of sever different sanitizing ions and a surface corona discharge process. Murphy teaches the production of ozone from water. The ozone is used as the disinfector. Applicant teaches a solid state device. Every reference to any component in Applicant's application is to a non-liquid. Examiner, in the most recent final office action, stated that the use of water was taught by Applicant. Applicant respectfully disagrees. Applicant's only references to water appear on pages 11 and 14 of its application. These references are to water as the *object* of purification or sanitation, not to the *source* of the sanitizing element. Applicant does not use water to create its sanitizing element. Murphy always uses water to create its sanitizing element. Applicant's device, although it may be used to purify water, does not use water and is thus non-aqueous.

Murphy also teaches away from the use of corona. Murphy mentions the disadvantages of corona. See Murphy Col. 1, line 49 to Col. 2, line 13. In contrast, one of Applicant's sanitizing device embodiments is corona.

<u>Applicant's Application Contains Support For Applicant's Amendments.</u>

Notwithstanding the forgoing, applicant's latest amendments find support in the specification.

Applicant discloses several sanitizing components that do not include an iodine ion releasing electrolyte, including chemical, electrochemical, and/or corona cells. See Application, p. 8, line 21. The application discloses a chemical purifier comprising a porous matrix impregnated with *one or more* of the following materials that do not contain any iodine: peroxides; superoxides, fluorates; chlorates, bromates; and permanganates. See Application, p. 8, line 21 – p. 9, line 2.

In the electro chemical embodiment, an anodic and cathodic component is disclosed that *may be* fabricated from the same or different material including many non iodine sources such as titanium, nickel, copper, silver, platinum, palladium, zinc, aluminum, steel, and mixtures and alloys thereof, and ceramics made of perovskites, and carbides. See Application, p. 9, lines 15-20. The electrolyte component in this embodiment *may be* fabricated from several materials including an oxide containing material, an ion exchange membrane, an alkali ion conducting material, a silver or copper ion conducting material, and an ion conducting ceramic material. See Application, p. 9, lines 2-5. Even if a halide material is used for the electrolyte component, the applicant's disclosure contemplates and discloses the use of PbF_2 and LaF_3 as a halide containing electrolyte. See Application, p. 10, line 9. These materials are not a source of iodine and do not release an iodine ion. Several oxide containing materials are also disclosed which are not a source of iodine, including beta aluminas or Nasicon materials. See Application, p. 10, line 12. The ion exchange member of the electrochemical embodiment of Applicant's application may be Nasicon, beta-alumina or other monovalent or divalent ions that do not include iodine. See Application, p. 10, lines 13-15. Applicant also teaches alkali ion conducting electrolyte material including all materials with a conductivity that greater than 10 to the power -10 $(\text{ohm cm})^{-1}$ which by definition, does not include iodine.

Finally, Applicant's application also teaches a sanitizing device in the embodiment of a corona cell. Corona cells do not contain any source of iodine. The comprise dielectric materials select from the group consisting of metal oxides such as titanium, aluminum and silicon oxides. See Application, p. 11, lines 5-12. Accordingly, Applicant's disclosure has many examples of embodiments that do not contain an iodine ion releasing electrolyte.

DATED this 22nd day of April, 2006,

Respectfully submitted,

David B. Fonda
Reg. No. 39,672
Attorney for Applicant